BETA-DECAY AND DELAYED NEUTRON EMISSION OF VERY NEUTRON-RICH NUCLEI *

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The weak interaction rates of very neutron-rich nuclei are among the most poorly known ingredients needed for stellar r-process modeling. Recently the nuclei near the closed neutron shells at N=50,82,126 have been intensively studied at the RIB facilities. Comparison with the experimental data shows that the self-consistent framework can provide a reasonably sound prediction of the weak rates in the regions far from stability.

We briefly describe the continuum QRPA approach in terms of the finite Fermi-system theory. The ground state properties are treated within the nuclear energy-density functional framework [1,2]. The β-decay strength functions are calculated taking into account the Gamow-Teller and first-forbidden transitions [3].

The impact of the T=1 and T=0 pairing on the β-decay and delayed neutron emission rates has been studied. A performance of existing global models for the nuclides near the r-process paths at N=50, 82, 126 is critically analyzed and confronted with the recent RIB experiments in the regions of ^{78}Ni [4], ^{132}Sn [5] and "east" of ^{208}Pb [6].

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